Summary of the Office Action

Claims 1, 3, 8 and 10-12 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,218,302 to *Braeckelmann et al.*.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Braeckelmann et al.* in view of U.S. Patent No. 6,441,467 to *Toyosawa et al.*

Summary of the Response to the Office Action

Applicants have amended claims 1 and 8. Claims 1, 3, and 8-13 are pending.

The Rejection under 35 U.S.C. §§ 102(e) and 103(a)

Claims 1, 3, 8 and 10-12 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,218,302 to *Braeckelmann et al.*, and claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Braeckelmann et al.* in view of U.S. Patent No. 6,441,467 to *Toyosawa et al.* Applicants respectfully traverse the rejections for at least the following reasons.

With respect to independent claims 1 and 8, as amended, Applicants respectfully assert that *Braeckelmann et al.* does not teach or suggest a combination including a planarized polyimide which is formed directly on a surface of the silicon nitride film and directly surrounding the metal interconnect layer including a side wall thereof. The Office Action page 2 alleges that "*Braeckelmann et al.* shows a semiconductor device comprising a metal interconnect layer (83, FIG. 11) covering over said silicon nitride film, said metal interconnect layer being consist of gold material (col. 7, lines 23-26) and a planarized polyimide (1102, FIG. 11) formed on the metal interconnect layer." Furthermore, the Office Action page 3 alleges that "FIG. 11 of *Braeckelmann et al.* shows a semiconductor device comprising a metal interconnect region (83) consist of gold material (col. 7, lines 23-26) covering over the barrier region, thereby forming a metal interconnect region, and a planarized polyimide (1102) covering the metal interconnect

layer and the silicon nitride surface around the metal interconnect region." Applicants respectfully disagree.

In contrast to the Applicants' claimed invention, *Braeckelmann et al.* teaches that a conductive interconnect 91 (i.e., metal interconnect region) is formed by removing portions of the conductive alloy capping film 84, the conductive film 83 (alleged to be the metal interconnect layer), the seed layer 82, and the adhesion/barrier layer 81. In addition, ILD or insulating films 71-73 are formed surrounding the conductive interconnect 91, and the passivation film 1001 (silicon oxynitride film overlying plasma enhanced nitride film) is formed overlying edge portions of the conductive layer 83. However, the polyamide film 1102 of *Braeckelmann et al.* is not formed "directly surrounding the metal interconnect layer (i.e., conductive layer 83) with including a side wall thereof" as claimed in the present invention.

Furthermore, in accordance with the presently claimed invention, the upper most metal interconnect layer is formed thin using gold to benefit the simpler design rule structure. In addition, the gold metal interconnect layer provides a low resistance and a high resistance to humidity (moisture resistance). Moreover, by combining the gold metal interconnect layer with the silicon nitride film as a barrier layer, the resultant structure provides a desired protection for the lower layers, stabilizing the function of semiconductor as compared to a conventional combination of an aluminum metal interconnect layer and a thick passivation layer, shorter lead time, and lower manufacturing cost . Applicants respectfully submit that *Braeckelmann et al.* merely states that the conductive layer 83 can be formed using gold, however, is completely silent with regard to the structures of conductive layer using gold, benefit of using gold as the upper most metal interconnect layer, and problems that can be solved using gold (col. 7, lines 23-26).

Accordingly, in light of the arguments presented above, Applicants respectfully assert that *Braeckelmann et al.* does not teach or suggest at least the features of the amended independent claims 1 and 8, thus, *Braeckelmann et al.* fails to anticipate at least the amended independent claims 1 and 8. In addition, Applicants respectfully assert that *Toyosawa et al.* fails to cure the deficiencies of *Braeckelmann et al.* Accordingly, Applicants respectfully request that rejection of claims under 35 U.S.C. §§ 102(e) and 103(a) be withdrawn because *Braeckelmann et al.* and *Toyosawa et al.*, whether taken singly or combined, fails to teach or suggest every element recited in at least the amended independent claims 1 and 8, hence dependent claims 3 and 9-13. Furthermore, Applicants respectfully submit that dependent claims 3 and 9-13 are allowable for all of the reasons discussed above with regard to amended independent claims 1 and 8, from which they respectfully depend, as well as the individual features that dependent claims 3 and 9-13 recite.

CONCLUSION

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing all pending claims in condition for allowance. Applicants submit that the claim amendments do not raise new issues or necessitate additional search of the art by the Examiner.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite the prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted

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